What is claimed is:

1. A method for receiving a signal comprising:

receiving a plurality of replicas of the signal, each of the plurality of replicas being received by one of a corresponding plurality of antenna elements so as to thereby generate a plurality of received signal replicas;

orthogonally multiplexing the plurality of received signal replicas into a multiplexed signal provided to a single processing chain; and

transforming, within the single processing chain, the multiplexed signal into a plurality of separate signals wherein each of the plurality of separate signals corresponds to one of the replicas of the signal.

2. The method of claim 1 wherein the transforming includes frequency downconverting the multiplexed signal, thereby generating a downconverted multiplexed signal.

3. The method of claim 2 further including converting the downconverted multiplexed signal to a digital multiplexed signal.

4. The method of claim 3 further including demultiplexing the digital multiplexed signal into the plurality of separate signals.

5. The method of claim 1, wherein the orthogonally multiplexing comprises frequency spreading the plurality of replicas on to the single processing chain according to an orthogonal coding scheme.

6. The method of claim 5, wherein the frequency spreading is carried out according to a Walsh coding scheme.

7. The method of claim 6, wherein the frequency spreading is carried out according to a complex Walsh coding scheme.

8. The method of claim 1, wherein the orthogonally multiplexing comprises offsetting, by ninety degrees in phase, one of the plurality of replicas from another one of the plurality of replicas.

9. The method of claim 8, further comprising:

multiplying the other one of the plurality of replicas by a first square wave;

multiplying the one of the plurality of replicas by a second square wave offset in phase from the first square wave by ninety degrees.

10. The method of claim 9, wherein the first and second square waves reverse polarity during each cycle.

11. The method of claim 1, further including:

pulse match filtering each of the separate signals.

12. The method of claim 1, wherein the receiving includes receiving the plurality of replicas of the signal as uncorrelated replicas of the signal.

13. The method of claim 1, wherein the orthogonally multiplexing the plurality of replicas includes:

switching between a first subset of the plurality of antenna elements to create a first signal of respective replicas of the signal from the first subset of the plurality of antenna elements;

switching between a second subset of the plurality of antenna elements to create a second signal of respective replicas of the signal from the second subset of the plurality of antenna elements;

offsetting, in phase, the second signal from the first signal; and

combining the second signal with the first signal thereby forming the multiplexed signal.

14. A method for receiving a signal comprising:

receiving a multiplicity of replicas of the signal, each of the multiplicity of replicas being received by one of a corresponding multiplicity of antenna elements so as to thereby generate a multiplicity of received signal replicas;

switching signal energy from among ones of a first subset of the multiplicity of antenna elements to create a first signal comprising signal energy from each of the ones of the first subset of the multiplicity of antenna elements;

switching signal energy from among ones of a second subset of the multiplicity of antenna elements to create a second signal comprising signal energy from each of the ones of the second subset of the multiplicity of antenna elements;

offsetting, in phase, the second signal from the first signal;

combining the second signal with the first signal, thereby forming a multiplexed signal comprising information representative of each respective replica of the signal; and

transforming, within the single processing chain, the multiplexed signal into separate signals wherein each of the separate signals corresponds to one of the replicas of the signal.

15. The method of claim 14 wherein the transforming includes frequency downconverting the multiplexed signal, thereby generating a downconverted multiplexed signal.

16. The method of claim 15 further including converting the downconverted multiplexed signal to a digital multiplexed signal.

17. The method of claim 16 further including demultiplexing the digital multiplexed signal into the separate signals.

18. The method of claim 14, wherein the switching signal energy from among ones of a first subset of the multiplicity of antenna elements includes switching between a first pair of the multiplicity of antenna elements to create the first signal, wherein the switching signal energy from among ones of a second subset of the multiplicity of antenna elements includes switching between a second pair of the multiplicity of antenna elements to create the second signal.

19. The method of claim 18, wherein the switching between the first pair of the multiplicity of antenna elements includes multiplying each respective replica of the signal at each of the first pair of the multiplicity of antenna elements by respective square waves wherein each of the respective square waves are out of phase by 180 degrees.

20. The method of claim 19, wherein the respective square waves reverse polarity during each cycle.

21. The method of claim 18, wherein the switching between the first pair of the multiplicity of antenna elements includes multiplying each respective replica of the signal at each of the first pair of the multiplicity of antenna elements by respective square waves wherein each of the respective square waves are out of phase by 90 degrees.

22. The method of claim 21, wherein the respective square waves reverse polarity during each cycle.

23. An apparatus for receiving a signal comprising:

a plurality of antenna elements, wherein the plurality of antenna elements are spatially arranged to receive one of a corresponding plurality of replicas of the signal so as to be capable of generating a plurality of received signal replicas;

a signal processing chain; and

an orthogonal multiplexer, coupled between the plurality of antenna elements and the signal processing chain, wherein the orthogonal multiplexor is configured to receive the plurality of received signal replicas and orthogonally multiplex the plurality of received signal replicas as a multiplexed signal on to the signal processing chain;

wherein the signal processing chain includes a demultiplexer configured to transform the multiplexed signal into a plurality of separate signals, wherein each of the plurality of separate signals corresponds to one of the replicas of the signal.

24. The apparatus of claim 23, wherein the orthogonal multiplexer includes:

a first switch coupled to a first subset of the plurality of antenna elements wherein the first switch is configured to switch between a first subset of the plurality of antenna elements to create, at an output of the first switch, a first signal of respective replicas of the signal from the first subset of the plurality of antenna elements;

a second switch coupled to a second subset of the plurality of antenna elements wherein the second switch is configured to switch between a second subset of the plurality of antenna elements to create, at an output of the second switch, a second signal of respective replicas of the signal from the second subset of the plurality of antenna elements;

a phase offsetting portion coupled to the output of the second switch wherein the phase offsetting portion is configured to generate, at an offsetting output, an offset signal wherein the offset signal is offset in phase from the first signal; and

a signal combiner coupled to the output of the first switch and the offsetting output and configured to receive and combine the first signal and the offset signal to form the multiplexed signal on the signal processing chain.

25. The apparatus of claim 24, wherein the first and second switches are single-pole double-throw switches.

26. The apparatus of claim 23, wherein the orthogonal multiplexer comprises:

a plurality of mixers configured to provided a plurality of mixed signals, wherein each of the plurality of mixers is coupled to one of the plurality of antenna elements, wherein each mixer is configured to generate one of the plurality of mixed signals by mixing one of a plurality of orthogonal switching signals with the one of the corresponding plurality of replicas of the signal received at each of the plurality of antenna elements; and

a combiner coupled the plurality of mixers and configured to receive and combine the plurality of mixed signals thereby forming the multiplexed signal.

27. The apparatus of claim 23 wherein the signal processing chain includes:

a downconverting mixer coupled to the orthogonal mixer, wherein the downconverting mixer is configured to downconvert the multiplexed signal into a downconverted multiplexed signal.

28. The apparatus of claim 27 wherein the signal processing chain includes:

an analog to digital converter coupled to the downconverting mixer wherein the analog to digital converter is configured to convert the downconverted multiplexed signal into a digital multiplexed signal, wherein the demultiplexer is configured to transform the digital multiplexed signal into the plurality of separate signals.

29. An apparatus for receiving a signal comprising:

means for receiving a plurality of replicas of the signal;

a signal processing chain;

means for orthogonally multiplexing the plurality of received signal replicas into a multiplexed signal provided to the signal processing chain; and

means for transforming, within the signal processing chain, the multiplexed signal into a plurality of separate signals wherein each of the plurality of separate signals corresponds to one of the replicas of the signal.

30. The apparatus of claim 29 wherein the means for transforming includes means for frequency downconverting the multiplexed signal into a downconverted multiplexed signal.

31. The apparatus of claim 30 further including means for converting the downconverted multiplexed into a digital multiplexed signal.

32. The apparatus of claim 31 further including means for demultiplexing the digital multiplexed signal into the plurality of separate signals.

33. The apparatus of claim 29, wherein the means for orthogonally multiplexing comprises means for frequency spreading the plurality of replicas on to the signal processing chain according to an orthogonal coding scheme.

34. The apparatus of claim 33, wherein the means for frequency spreading comprises means for carrying out frequency spreading according to a Walsh coding scheme.

35. The apparatus of claim 34, wherein the means for frequency spreading comprises means for carrying out the frequency spreading according to a complex Walsh coding scheme.

36. The apparatus of claim 29, wherein the means for orthogonally multiplexing comprises means for offsetting, by ninety degrees in phase, one of the plurality of replicas from another one of the plurality of replicas.

37. The apparatus of claim 36, further comprising:

means for multiplying the other one of the plurality of replicas by a first square wave; and

means for multiplying the one of the plurality of replicas by a second square wave offset in phase from the first square wave by ninety degrees.

38. The apparatus of claim 37, wherein the means for multiplying the other one and the means for multiplying the one include respective means for multiplying the other one and the one of the plurality of replicas by the first square wave first and second square waves wherein the first and second square waves reverse polarity during each cycle.

39. The apparatus of claim 29, further including:

means for pulse match filtering each of the separate signals.

40. The apparatus of claim 29, wherein the means for receiving includes means for receiving the plurality of replicas of the signal as uncorrelated replicas of the signal.

41. The apparatus of claim 29, wherein the means for orthogonally multiplexing the plurality of replicas includes:

means for switching between a first subset of the plurality of antenna elements to create a first signal of respective replicas of the signal from the first subset of the plurality of antenna elements;

means for switching between a second subset of the plurality of antenna elements to create a second signal of respective replicas of the signal from the second subset of the plurality of antenna elements;

means for offsetting, in phase, the second signal from the first signal; and

means for combining the second signal with the first signal thereby forming the multiplexed signal.

42. A method for orthogonally multiplexing a signal comprising:

generating a plurality of orthogonal signals;

multiplying each of the plurality of orthogonal signals by one of a corresponding plurality of replicas of the signal so as to thereby generate a plurality of coded signal replicas, wherein each of the plurality of replicas of the signal is received by one of a corresponding plurality of antenna elements; and

combining the plurality of coded signal replicas to form an orthogonally multiplexed signal.

43. The method of claim 42, wherein the generating includes generating the plurality of orthogonal signals according to a Walsh coding scheme.

44. The method of claim 42, wherein the generating includes generating at least two of the orthogonal signals as orthogonal signals that reverse polarity during each cycle.

45. The method of claim 1, wherein the signal complies with a communication protocol selected from the group consisting of: orthogonal frequency division multiplexing (OFDM), time division multiple access (TDMA), code division multiple access (CDMA), gaussian minimum shift keying (GMSK), complementary code keying (CCK), quadrature phase shift keying (QPSK), frequency shift keying (FSK), phase shift keying (PSK), and quadrature amplitude modulation (QAM).